

## PATENT ABSTRACTS OF JAPAN

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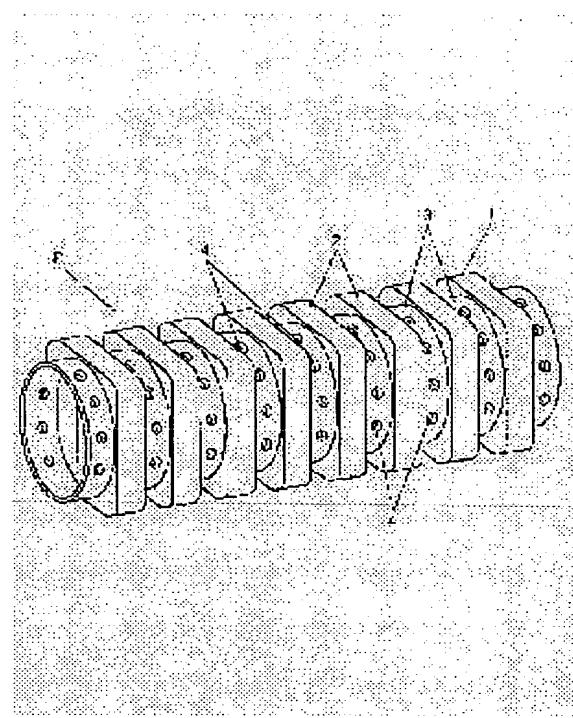
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**(54) COVERED CONDUIT PIPE****(57) Abstract:**

**PROBLEM TO BE SOLVED:** To realize stable piping matchable to a bottom surface of a groove excavated on the ground surface by alternately arranging a cross-sectional square wall part and a cross-sectional circular wall part in the lengthwise direction, boring and forming a large number of water gathering small holes, and forming the whole of a synthetic resin raw material or a rubber raw material in a pipe wall.

**SOLUTION:** In a pipe wall 1, a cross-sectional square wall part 2 and a cross-sectional circular wall part 3 are alternately arranged in the lengthwise direction. A large number of water gathering small holes 4 are bored and formed in pipe wall 1 parts, and the whole is formed of a hard raw material such as synthetic resin or rubber excellent in pressure-proof flattening performance. Because the cross-sectional square wall part 2 of a pipe wall 1 exists, when it is buried underground, piping can be stably and excellently made in a constant posture, and even after the piping, a position is not easily dislocated, and a piping posture can be easily maintained.

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## CLAIMS

## [Claim(s)]

[Claim 1] Closed conduit tubing in which a part for a part for a cross-section rectangle wall (2) and a cross-section circular wall (3) is arranged in for the tube wall (1) by turns in the longitudinal direction, drilling formation of many stomata for catchment (4) is carried out at this tube wall (1) part, and the whole is formed with the synthetic-resin material or the rubber material.

[Claim 2] In the longitudinal direction, a part for a part for a cross-section rectangle wall (2) and a cross-section circular wall (3) is arranged for the tube wall (1) by turns. Closed conduit tubing made into the shape of an abbreviation square in which the corner was formed for the configuration for said cross-section rectangle wall (2) in the shape of radii by carrying out drilling formation of many stomata for catchment (4), and forming the whole in this tube wall (1) part with a synthetic-resin material or a rubber material.

[Claim 3] In the longitudinal direction, a part for a part for a cross-section rectangle wall (2) and a cross-section circular wall (3) is arranged for the tube wall (1) by turns. Drilling formation of many stomata for catchment (4) is carried out at this tube wall (1) part, and the whole is formed with a synthetic-resin material or a rubber material, and it sets to the inner skin of said tube wall (1). Closed conduit tubing with which a part for the circular wall which adjoins the central part and this part of the flat side (2a) in a part for a rectangular wall (2) (3) is formed in the abbreviation same side.

[Claim 4] Closed conduit tubing in which a part for a part for a cross-section rectangle wall (2) and a cross-section circular wall (3) is arranged in for the tube wall (1) by turns in the longitudinal direction, drilling formation of many stomata for catchment (4) is carried out at a part for the circular wall of this tube wall (1) (3), and the whole is formed with the synthetic-resin material or the rubber material.

[Claim 5] Closed conduit tubing in which a part for a part for a cross-section rectangle wall (2) and a cross-section circular wall (3) is arranged in for the tube wall (1) by turns in the longitudinal direction, drilling formation of many stomata for catchment (4) is carried out at a part for the rectangular wall of this tube wall (1) (2), and the whole is formed with the synthetic-resin material or the rubber material.

[Claim 6] Closed conduit tubing in which a part for a part for a cross-section rectangle wall (2) and a cross-section circular wall (3) is arranged in for the tube wall (1) by turns in the longitudinal direction, drilling formation of many stomata for catchment (4) is carried out at a part for a part for the rectangular wall of this tube wall (1) (2), and a circular wall (3), and the whole is formed with the synthetic-resin material or the rubber material.

[Claim 7] In the longitudinal direction, a part for a part for a cross-section rectangle wall (2) and a cross-section circular wall (3) is arranged by turns, and a tube wall (1) sets to the hoop direction of this tube wall (1). Closed conduit tubing by which drilling formation of many stomata for catchment (4) is carried out, and the whole is formed in the peripheral wall part except the predetermined flat side (2a) for a rectangular wall (2), and the predetermined include-angle range (alpha) containing this with the synthetic-resin material or the rubber material.

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Field of the Invention] Generally this invention is called closed conduit tubing, it is the catchment drain pipe used laying underground in the earth, is laid under the underground, such as land developed for housing lots, a golf course, farmland, a pinion wall, and a bank, collects subterranean storm sewage and springwater, and relates to tubing used in order to show a necessary drainage ditch and to drain.

[0002]

[Description of the Prior Art] From the former, generally this kind of closed conduit tubing is known widely, and is used. Generally this conventional closed conduit tubing is a product made of synthetic resin, and is tubing of the shape of a cylinder formed in the shape of a spiral irregularity wave. (For example, refer to JP,61-93528,U public presentation specification)

[0003]

[Problem(s) to be Solved by the Invention] It faced carrying out underground piping in the earth in the case of tubing formed such in the shape of a cylinder, and stability was bad and was what is easy to cause a twist to a tubing hoop direction. Therefore, even if it designs beforehand so that the part which shall have formed the stoma for catchment except for the predetermined include-angle range in a tubing hoop direction for the purpose of making the once collected water drain certainly in tubing, and does not have this stoma may be turned caudad and it may pipe. Since it became difficult to turn a part without a stoma caudad certainly and to pipe according to the twist phenomenon of tubing, if it was in the conventional closed conduit tubing, it considered as the structure which has formed the stoma for catchment throughout the tubing hoop direction.

[0004] This invention tends to offer closed conduit tubing made into the special structure from which manufacture is easy and does not serve as cost quantity like the case of the conventional closed conduit tubing in manufacture for the purpose of solving the technical problem which the conventional closed conduit tubing has paying attention to the above technical problems which the conventional closed conduit tubing has.

[0005]

[Means for Solving the Problem] Closed conduit tubing said to this invention devised in order to solve this technical problem makes a part for a part for the cross-section rectangle wall 2, and the cross-section circular wall 3 have arranged the tube wall 1 by turns in a longitudinal direction, makes this tube wall 1 part carry out drilling formation of many stomata 4 for catchment, and is considered as the configuration which has formed the whole with the synthetic-resin material or the rubber material.

[0006]

[Embodiment of the Invention] Even if the cross-section configuration for the cross-section rectangle wall 2 said here is good also as a thing of a square-like thing, a perpendicular direction, or the shape of a horizontally long rectangle and is in a part for the cross-section circular wall 3, it can also be made into the thing of a perfect circle configuration, and the thing of a hen's egg form or an ellipse. Moreover, although the amount of [ 2 ] cross-section rectangle wall may be the square square shape, it is convenient handling to have made the corner into the shape of radii.

[0007] If in charge of this operation, in the inner skin of a tube wall 1, shall have formed in the abbreviation same side a part for the circular wall 3 which adjoins the central part and this part of flat side 2a in a part for the rectangular wall 2, or Only to a part for a part for the circular wall 3 of a tube wall 1, and the rectangular wall 2, shall have carried out drilling formation of many stomata 4 for catchment, or To a part for both a part for the rectangular wall 2, and the circular wall 3, shall have carried out drilling formation and many stomata 4 for catchment are set in the hoop direction of a tube wall 1. It can carry out as what has carried out drilling formation of many stomata 4 for catchment only into the peripheral wall part except the predetermined include-angle range alpha containing predetermined flat side 2a for the rectangular wall 2, and this.

[0008] As a synthetic-resin material which forms closed conduit tubing said to this invention, selection use of polyethylene or the synthetic-resin material of polyvinyl-chloride polypropylene and other arbitration can be carried out, selection use of the materials of arbitration, such as natural rubber and synthetic rubber, can be carried out as a rubber material, and since it is the shell used laying underground in the earth, the hard material excellent in the proof-pressure flat engine performance is suitable.

[0009] Closed conduit tubing of this invention considered as such a configuration by existence for a cross-section rectangle wall [ two ] of a tube wall 1 Can pipe with sufficient stability with a fixed posture, and especially, when trenching in the earth and piping it, even if it is Even if it can position with sufficient stability and is after piping, a location gap is not caused easily and it is easy to maintain a piping posture by laying the flat side for the rectangular wall 2 in a groove bottom.

[0010]

[Example] Next, the example of this invention is explained based on an attached drawing. Drawing 1 thru/or drawing 4 are drawings having shown closed conduit tubing of the 1st example of this invention. Drawing 1 is the perspective view having shown the appearance of Shell P, drawing 2 shows the condition of having cut the central part of a tube wall 1 along with the longitudinal direction of a shell, and drawing 3 shows the condition of having cut a part for the cross-section circular wall 3 of a tube wall 1 to the hoop direction of a shell.

[0011] The structure of the shell P shown in this example sets the configuration of a tube wall 1 in the direction of a tube axis, as shown in these drawings. A part for a part for the rectangular wall 2 which made the cross-section configuration the shape of an abbreviation square, and the circular wall 3 which made the cross-section configuration the circle configuration is arranged by turns, it considers as the structure which has carried out continuation formation, and two or more stoma 4 -- for catchment is made [ at the shape of bellows ] into the structure of this circular wall part 3 -- which has carried out drilling formation each. In addition, the bellows-like wave of the tube wall 1 said here can also be carried out as a wave-like thing which stands in a row spirally.

[0012] It \*\*, and the shell P shown in this example makes the cross-section configuration for the rectangular wall 2 the shape of a square which made the corner round so that drawing 1 , drawing 3 , and drawing 4 may see, and the amount of [ which adjoins the central part and this part of flat side 2a in a part for this rectangular wall 2 / 3 ] circular wall has become bellows-like. However, it can make it possible to move smoothly the water which caught water in Shell P in the condition that resistance is lessened and there is no stagnation, by forming parts for both these walls 2a and 3 so that it may continue in respect of the abbreviation same in the inner skin of a tube wall 1.

[0013] Moreover, the shell P shown in this example does not form the stoma 4 for catchment in the predetermined include-angle range alpha part containing the part which adjoins one flat side (flat side of the bottom in drawing 3 ) 2a for the rectangular wall 2, but makes it the structure which has carried out drilling formation of the stoma 4 for catchment only at other parts except this include-angle range alpha so that drawing 3 may see. It enables it to have protected being discharged in the earth again from the stoma for catchment which has formed the water which once caught water in Shell P at the tubing bottom by doing in this way by carrying out caudad the flat side 2a part in which this stoma 4 for catchment is not formed, and piping.

[0014] In \*\*(ing) and manufacturing the shell P of such structure By extruding melting resin in the shape of a tube from the resin extruder arranged on the end side, and blowing high-pressure air into the tube into the continuation mold for the tubing of the well-known Caterpillar method Or what is necessary is just to carry out sequential drilling formation of aforementioned stoma 4 -- for catchment, after making it fabricate continuously one by one, finishing shaping in the part which the shell moved to the method of outside from the mold and a shell's hardening, pushing against a mold the tube which is in a melting condition by making coincidence attract air from a mold.

[0015] Drawing 5 illustrates the shell P made into such structure, and P about the means which carries out connection connection using a pipe joint. This connecting means After fitting into a part for the cross-section circular wall 3 near the edge of Shell P at each the packing 12 and 12 which was rich in the rubber elasticity which has the circular hole of a part for this cross-section circular wall 3, and abbreviation isomorphism, and has made the appearance the somewhat larger configuration than the appearance for this cross-section rectangle wall 2 by the shape of a square of a part for the cross-section rectangle wall 2, and an analog, It is made to insert in the central part of the joint 10 which made a part for both ends the shape of an rectangular pipe for the packing 11 of the shape of an another ring made to intervene between the comparison end faces of both the tubing P and P, and made the central part cylindrical, both the tubing P and P is pushed in from both sides to this joint 10, and it is made to connect. In addition, although explanation is omitted, it cannot be overemphasized that you may connect with other means.

[0016] The shell P shown in drawing 6 thru/or drawing 8 is tubing of the 2nd example in which another example of the shell P shown in said 1st example is shown, and that main difference makes stoma 4 -- for catchment of a large number formed in a part for the circular wall 3 in the shell P shown in said 1st example the structure which does not form in a part for this circular wall 3, but has been formed in a part for the rectangular wall 2. Also in this 2nd example structure, these stoma 4 -- for catchment as well as the case of said 1st example so that drawing 8 may see The stoma 4 for catchment is not formed in the predetermined include-angle range alpha part containing the lower part of the vertical flat side which stands in a row on one all and these both sides of flat side (flat side of the bottom in drawing 8 ) 2a for the rectangular wall 2. It considers as the structure which has carried out drilling formation of stoma 4 -- for catchment only at a part for other parts except this include-angle range alpha, i.e., the residual part of the both length flat side, and an upper edge part.

[0017] the shell P shown in drawing 9 is tubing of the 3rd example of Shell P in which another example was shown further, and the shell P of this example makes much stoma 4 -- for catchment the structure for a part for the circular wall 3, and the rectangular wall 2 which boils, respectively and has been formed. In this example structure as well as the case of said 1st example and the 2nd example, these stoma 4 -- for catchment If it is in a part for the predetermined include-angle range which contains the lower part of the vertical flat side which stands in a row on all and these both sides of flat side 2a of that lower part if it is in a part for the rectangular wall 2, and the circular wall 3, it has considered as the field where the stoma 4 for catchment is not formed in the predetermined include-angle range of the lower part part corresponding to a part for this rectangular wall 2.

[0018] The shell P shown in drawing 10 and drawing 11 is what showed the deformation example of Shell P further. To a part for the rectangular wall 2, the core for the circular wall 3 is displacing to the downward flat side 2a side in one flat side 2a for the rectangular wall 2, and drawing, and considers as the structure where the inside for the rectangular wall 2 and the inside for the circular wall 3 form an abbreviation same side, only in this lower part part. thus, the water which caught water when carried out -- resistance -- there is an advantage which can be discharged few. Moreover, it can also carry out as structure which does not need to form in this way in [ the amount of / a part for the rectangular wall 2 and / 3 / circular wall ] the said heart, and is carrying out the relative displacement.

[0019] In addition, the degree of hardness of the synthetic-resin material which forms the shell P said to this invention should just carry out selection use of the thing of the degree of hardness of arbitration by magnitude, a burial depth to underground, etc. of the shell to manufacture. However, since it is tubing used laying underground in the earth, it is desirable to select the class of material, a degree of hardness, and a water resisting property so that it may have proof-pressure flat reinforcement in consideration of the external pressure received in a tube wall 1.

[0020] Although the typical example of this invention was explained above, this invention is not necessarily limited only to such example structures, is equipped with the aforementioned requirements for a configuration said to this invention, attains the aforementioned purpose, within limits which have the effectiveness said to below, can be changed suitably and can carry it out.

[0021]

[Effect of the Invention] A part for a part for a cross-section rectangle wall and a cross-section circular wall is made for this invention to have arranged the structure of a tube wall by turns in a longitudinal direction so that already clearly from the above explanation. Since this tube wall part is made to carry out drilling formation of many stomata for catchment and it considers as the configuration which has formed the whole with the synthetic-resin material or the rubber material The base of the slot faced carrying out underground piping and trenched the ground is made to meet in the earth, and it can be piped with sufficient stability. the squirrel to which it had the advantage made easily, and the location gap was caused easily or positioning was twisted after piping -- it has the remarkable advantage of being easy to maintain a piping posture in the condition that there are nothings.

[0022] Moreover, it can manufacture efficiently in manufacture at high speed, and it also has the effectiveness that it can manufacture easily, without becoming cost quantity as compared with the thing of structure conventionally.

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DESCRIPTION OF DRAWINGS

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## [Brief Description of the Drawings]

[Drawing 1] The perspective view of a shell showing the 1st example.

[Drawing 2] Central drawing of longitudinal section which met in the direction of an axis of this shell.

[Drawing 3] Drawing of longitudinal section for a cross-section circular wall of this shell.

[Drawing 4] Drawing of longitudinal section for a cross-section rectangle wall of this shell.

[Drawing 5] Drawing of longitudinal section of the direction of a tube axis showing the connection connection condition of the said shells.

[Drawing 6] The perspective view of a shell showing the 2nd example.

[Drawing 7] The sectional view of the drawing 2 equivalent part of this shell.

[Drawing 8] The sectional view of the drawing 4 equivalent part of this shell.

[Drawing 9] The perspective view of a shell showing the 3rd example.

[Drawing 10] The sectional view of the drawing 2 equivalent part of this shell.

[Drawing 11] Furthermore, the sectional view of the drawing 3 equivalent part showing another example.

## [Description of Notations]

1 Tube Wall

2 A Part for Cross-Section Rectangle Wall

2a Flat side

3 A Part for Cross-Section Circular Wall

4 Stoma for Catchment

alpha Predetermined include-angle range

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[Translation done.]

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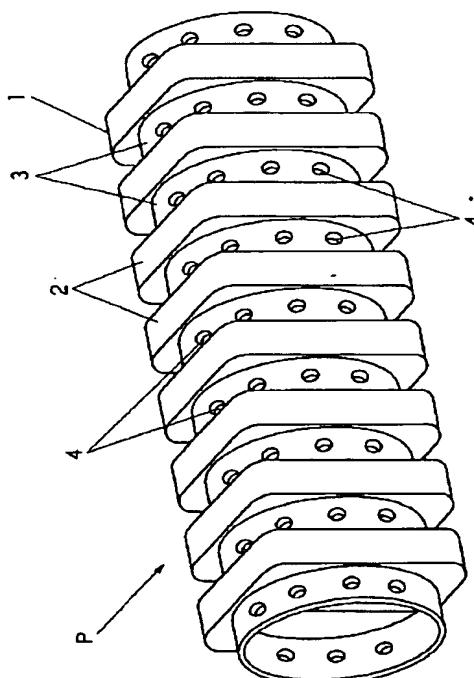
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(54)【発明の名称】暗渠管

## (57)【要約】

【課題】 地中に溝を掘って配管する場合に、一定の姿勢で安定性よく配管することができ、平坦辺とした部分を溝底に載置することによって、安定よく位置決めを行うことができ、配管後にあっても安易に位置ずれを起こすことがなく、配管姿勢を維持させておき易い暗渠管を得ること。

【解決手段】 管壁1を、長手方向において断面方形壁部分2と断面円形壁部分3とを交互に配設させてあるものとし、この管壁1部分に多数の集水用小孔4を穿設形成させ、全体を合成樹脂素材またはゴム素材によって形成してある構成とした。



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## 【特許請求の範囲】

【請求項1】 管壁(1)が、長手方向において断面方形壁部分(2)と断面円形壁部分(3)とが交互に配設されていて、この管壁(1)部分に多数の集水用小孔(4)が穿設形成され、全体が合成樹脂素材またはゴム素材によって形成されている暗渠管。

【請求項2】 管壁(1)が、長手方向において断面方形壁部分(2)と断面円形壁部分(3)とが交互に配設されていて、この管壁(1)部分に多数の集水用小孔(4)が穿設形成され、全体が合成樹脂素材またはゴム素材によって形成され、前記断面方形壁部分(2)の形状が、角部が円弧状に形成された略正方形状とされている暗渠管。

【請求項3】 管壁(1)が、長手方向において断面方形壁部分(2)と断面円形壁部分(3)とが交互に配設されていて、この管壁(1)部分に多数の集水用小孔(4)が穿設形成され、全体が合成樹脂素材またはゴム素材によって形成され、前記管壁(1)の内周面において、方形壁部分(2)における平坦辺(2a)の中央部分とこの部分に隣接する円形壁部分(3)とが略同一面に形成されている暗渠管。

【請求項4】 管壁(1)が、長手方向において断面方形壁部分(2)と断面円形壁部分(3)とが交互に配設されていて、この管壁(1)の円形壁部分(3)に多数の集水用小孔(4)が穿設形成され、全体が合成樹脂素材またはゴム素材によって形成されている暗渠管。

【請求項5】 管壁(1)が、長手方向において断面方形壁部分(2)と断面円形壁部分(3)とが交互に配設されていて、この管壁(1)の方形壁部分(2)に多数の集水用小孔(4)が穿設形成され、全体が合成樹脂素材またはゴム素材によって形成されている暗渠管。

【請求項6】 管壁(1)が、長手方向において断面方形壁部分(2)と断面円形壁部分(3)とが交互に配設されていて、この管壁(1)の方形壁部分(2)と円形壁部分(3)とに多数の集水用小孔(4)が穿設形成され、全体が合成樹脂素材またはゴム素材によって形成されている暗渠管。

【請求項7】 管壁(1)が、長手方向において断面方形壁部分(2)と断面円形壁部分(3)とが交互に配設されていて、この管壁(1)の周方向において、方形壁部分(2)の所定の平坦辺(2a)とこれを含む所定の角度範囲( $\alpha$ )を除く周壁部分に多数の集水用小孔(4)が穿設形成され、全体が合成樹脂素材またはゴム素材によって形成されている暗渠管。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】 本発明は、一般に暗渠管と呼ばれ、地中に埋設して使用される集水排水管で、造成地、ゴルフ場、農地、擁壁、堤防等の地中に埋設して、地中の雨水や湧水を集めて所要排水路に案内し排水するために用いる管に関するものである。

## 【0002】

【従来の技術】 従来から、この種の暗渠管は広く一般に

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知られ使用されている。この従来の暗渠管は一般には合成樹脂製で、螺旋凹凸波形状に形成された円筒状の管である。(例えば実開昭61-93528号公開明細書参照)

## 【0003】

【発明が解決しようとする課題】 このような円筒状に形成された管の場合には、地中に埋設配管するに際して安定性が悪く、管周方向に捩れを起こし易いものであった。そのため、管内に一旦集めた水を確実に排水させることを目的として、管周方向における所定の角度範囲を除いて集水用小孔を形成してあるものとし、この小孔のない部分を下方に向けて配管するように予め設計しても、管の捩れ現象によって、小孔のない部分を確実に下方に向けて配管することが困難となるため、従来の暗渠管にあっては、管周方向の全域に集水用小孔を形成してある構造とされていた。

【0004】 本発明は、従来の暗渠管が有している以上のような課題に着目し、従来の暗渠管がもつ課題を解決することを目的とし、製造に当たっては従来の暗渠管の場合と同様に製造が容易であってコスト高となることのない特殊構造とした暗渠管を提供しようとするものである。

## 【0005】

【課題を解決するための手段】 この課題を解決するためには講じた本発明にいう暗渠管は、管壁1を、長手方向において断面方形壁部分2と断面円形壁部分3とを交互に配設させてあるものとし、この管壁1部分に多数の集水用小孔4を穿設形成させ、全体を合成樹脂素材またはゴム素材によって形成してある構成としたものである。

## 【0006】

【発明の実施の形態】 ここにいう断面方形壁部分2の断面形状は、正方形状のもののみに限らず、垂直方向または水平方向に長い長方形状のものとしてもよく、断面円形壁部分3にあっても真円形状のもののみに限らず、鶏卵形や長円形のものとすることもできる。また、断面方形壁部分2は、角張った角形であってもよいが、角部を円弧状にしてあるのが取り扱いに便利である。

【0007】 この実施に当たっては、管壁1の内周面において、方形壁部分2における平坦辺2aの中央部分とこの部分に隣接する円形壁部分3とを略同一面に形成してあるものとしたり、管壁1の円形壁部分3だけに、または方形壁部分2だけに多数の集水用小孔4を穿設形成してあるものとしたり、方形壁部分2と円形壁部分3との両方に多数の集水用小孔4を穿設形成してあるものとしたり、また、管壁1の周方向において、方形壁部分2の所定の平坦辺2aとこれを含む所定の角度範囲 $\alpha$ を除く周壁部分だけに多数の集水用小孔4を穿設形成してあるものとして実施することができるものである。

【0008】 本発明にいう暗渠管を形成する合成樹脂素材としては、ポリエチレンやポリ塩化ビニール・ポリブ

ロビレンその他任意の合成樹脂素材を選択使用することができ、ゴム素材としては、天然ゴム、合成ゴム等任意の素材を選択使用することができ、地中に埋設して使用する管体であるから耐圧偏平性能に優れた硬質の素材が適している。

【0009】このような構成とした本発明の暗渠管は、管壁1の断面方形壁部分2の存在によって、一定の姿勢で安定性よく配管することができるものであり、殊に、地中に溝を掘って配管する場合にあっても、方形壁部分2の平坦辺を溝底に載置することによって、安定よく位置決めをおこなうことができ、配管後にあっても安易に位置ずれを起こすことがなく、配管姿勢を維持させておき易い。

【0010】

【実施例】次に、本発明の実施例について、添付の図面に基づいて説明する。図1乃至図4は本発明の第1実施例の暗渠管を示した図である。図1は管体Pの外形を示した斜視図であり、図2は管壁1の中央部分を管体の長手方向に沿って切断した状態を示し、図3は管壁1の断面円形壁部分3を管体の周方向に切断した状態を示したものである。

【0011】該実施例に示した管体Pの構造は、これらの図に示したように、管壁1の形状を管軸方向において、断面形状を略正方形とした方形壁部分2と、断面形状を円形状とした円形壁部分3とを交互に配置させて蛇腹状に連続形成してある構造とし、この円形壁部分3…のそれぞれに、複数の集水用小孔4…を穿設形成してある構造としたものである。なお、ここにいう管壁1の蛇腹状波形は螺旋状に連なる波形のものとして実施することもできる。

【0012】而して、該実施例に示した管体Pは、図1、図3及び図4にみられるように、方形壁部分2の断面形状を角部を丸くした正方形とした、この方形壁部分2における平坦辺2aの中央部分とこの部分に隣接する円形壁部分3とが蛇腹状となっている。しかし、これらの両壁部分2a、3を管壁1の内周面において略同一面で連続するように形成することによって、管体P内に集水した水を抵抗を少なくし漏みのない状態で円滑に移動させることができるようにすることができる。

【0013】また、この実施例に示した管体Pは、図3にみられるように、方形壁部分2の一つの平坦辺(図3における下側の平坦辺)2aに隣接する部分を含む所定の角度範囲 $\alpha$ 部分には集水用小孔4を形成せず、この角度範囲 $\alpha$ を除く他の部分だけに集水用小孔4を穿設形成してある構造としたものである。このようにすることによって、この集水用小孔4が形成されていない平坦辺2a部分を下方にして配管することにより、管体P内に一旦集水した水が、管の下側に形成してある集水用小孔から再び地中に排出されることを防ぐことができるようとしてある。

【0014】而して、このような構造の管体Pを製造するに当たっては、公知のキャタピラー方式の管成形用の連続型内に、その一端側に配した樹脂押出機から熔融樹脂をチューブ状に押し出し、そのチューブ内に高圧空気を吹き込むことによって、または同時に型から空気を吸引させることによって、熔融状態にあるチューブを型に押し付けながら順次連続的に成形させ、管体が型から外方に移動した箇所において、または成形を終えて管体が硬化した後で、前記の集水用小孔4…を順次穿設形成されればよい。

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【0015】図5は、このような構造とした管体P、Pどうしを管継手を利用して接続連結する手段について例示したものであって、この接続手段は、管体Pの端部近くの断面円形壁部分3に、該断面円形壁部分3と略同形の円形穴を有し外形が断面方形壁部分2と相似形の正方形で該断面方形壁部分2の外形よりも少し大きい形状としてあるゴム弾性に富んだパッキング12、12をそれぞれに嵌合した後、両管P、Pの突き合わせ端面間に介在させる別のリング状のパッキング11を、両端部分を角筒状とし中央部分を円筒状とした継手10の中央部分に挿入させておき、この継手10に対して両管P、Pを両側から押し込んで接続するようにしたものである。なお、説明は省略するが、他の手段によって連結してもよいことは言うまでもない。

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【0016】図6乃至図8に示した管体Pは、前記第1実施例に示した管体Pの別実施例を示す第2実施例の管であって、その主たる相違点は、前記第1実施例に示した管体Pにおいて円形壁部分3に形成した多数の集水用小孔4…を、この円形壁部分3には形成せず、方形壁部分2に形成してある構造としたものである。この第2実施例構造の場合も、前記第1実施例の場合と同様に、これらの集水用小孔4…も、図8にみられるように、方形壁部分2の一つの平坦辺(図8における下側の平坦辺)2aの全部とこの両側に連なる縦平坦辺の下側部分を含む所定の角度範囲 $\alpha$ 部分には集水用小孔4を形成せず、この角度範囲 $\alpha$ を除く他の部分、即ち両縦平坦辺の残余部分と上辺部分だけに集水用小孔4…を穿設形成してある構造としたものである。

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【0017】図9に示した管体Pは、管体Pの更に別実施例を示した第3実施例の管であって、該実施例の管体Pは、多数の集水用小孔4…を、円形壁部分3と方形壁部分2とのそれぞれに形成してある構造としたものである。この実施例構造の場合も、前記第1実施例及び第2実施例の場合と同様に、これらの集水用小孔4…は、方形壁部分2にあっては、その下方の平坦辺2aの全部とこの両側に連なる縦平坦辺の下側部分とを含む所定の角度範囲、円形壁部分3にあっては、この方形壁部分2に対応する下方部分の所定の角度範囲には集水用小孔4が形成されていない領域としてある。

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【0018】図10及び図11に示した管体Pは、更に

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管体Pの変形実施例について示したもので、方形壁部分2に対して円形壁部分3の中心が、方形壁部分2の一つの平坦辺2a、図において下方の平坦辺2a側に変位していて、この下方部分のみにおいて、方形壁部分2の内面と円形壁部分3の内面とが略同一面を形成する構造としたものである。このようにすると集水した水を抵抗少なく排出することができる利点がある。また、このように、方形壁部分2と円形壁部分3とは同心的に形成する必要はなく相対変位している構造として実施することもできるものである。

【0019】なお、本発明にいう管体Pを形成する合成樹脂素材の硬度は、製造する管体の大きさや地中への埋設深さ等によって任意の硬度のものを選定使用すればよい。しかしながら、地中に埋設して使用する管であるから、管壁1に受ける外圧を考慮して耐圧偏平強度をもつよう素材の種類と硬度と耐水性とを選定することが好みしい。

【0020】以上本発明の代表的な実施例について説明したが、本発明は必ずしもこれらの実施例構造のみに限定されるものではなく、本発明にいう前記の構成要素を備えていて、前記の目的を達成し、以下にいう効果を有する範囲内において適宜改変して実施することができるものである。

【0021】

【発明の効果】本発明は以上の説明から既に明らかかなように、管壁の構造を、長手方向において断面方形壁部分と断面円形壁部分とを交互に配設させてあるものとし、この管壁部分に多数の集水用小孔を穿設形成させ、全体を合成樹脂素材またはゴム素材によって形成してある構成としたものであるから、地中に埋設配管するに際して\*30

\* 地面に掘った溝の底面に沿わせて安定性よく配管することができ、位置決めが容易にできる利点を有し、配管後においても安易に位置ずれを起こしたり損れたりすことのない状態で配管姿勢を維持させておき易いという顕著な利点を有しているものである。

【0022】また、製造に当たっても高速で効率良く製造することができ、従来構造のものに比してコスト高となることもなく容易に製造することができるという効果をも兼ね備えている。

10 【図面の簡単な説明】

【図1】第1実施例を示す管体の斜視図。

【図2】同管体の軸線方向に沿った中央縦断面図。

【図3】同管体の断面円形壁部分の縦断面図。

【図4】同管体の断面方形壁部分の縦断面図。

【図5】同管体どうしの接続連結状態を示す管軸方向の縦断面図。

【図6】第2実施例を示す管体の斜視図。

【図7】同管体の図2相当部分の断面図。

【図8】同管体の図4相当部分の断面図。

20 【図9】第3実施例を示す管体の斜視図。

【図10】同管体の図2相当部分の断面図。

【図11】更に別実施例を示す図3相当部分の断面図。

【符号の説明】

1 管壁

2 断面方形壁部分

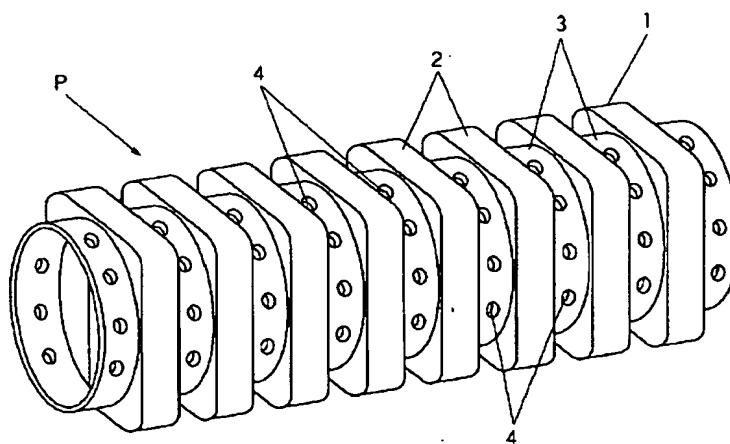
2a 平坦辺

3 断面円形壁部分

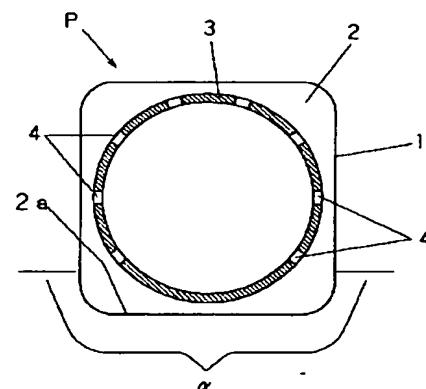
4 集水用小孔

$\alpha$  所定の角度範囲

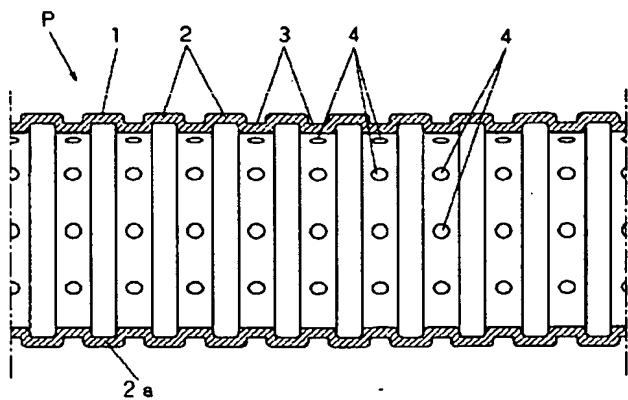
【図1】



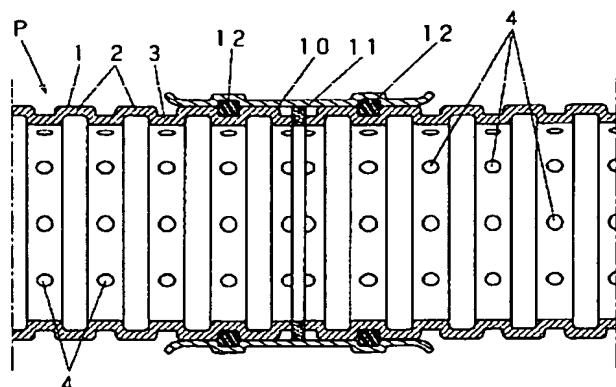
【図3】



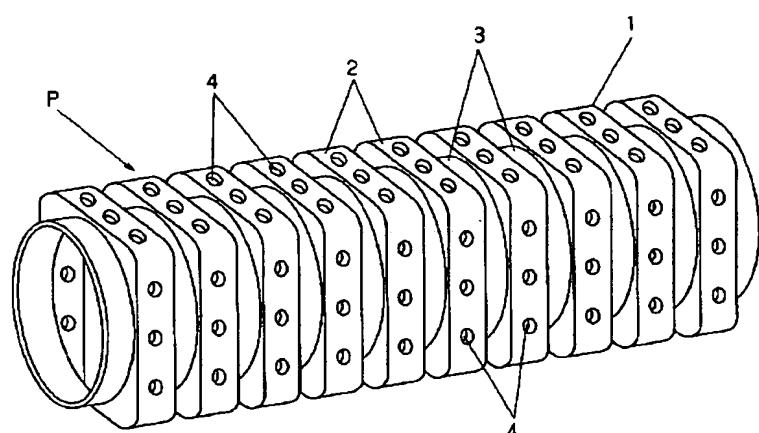
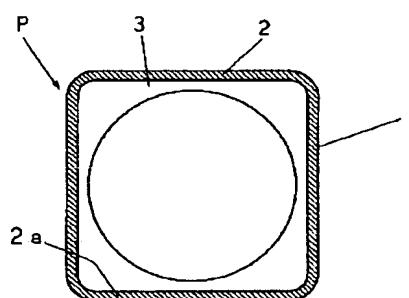
【図2】



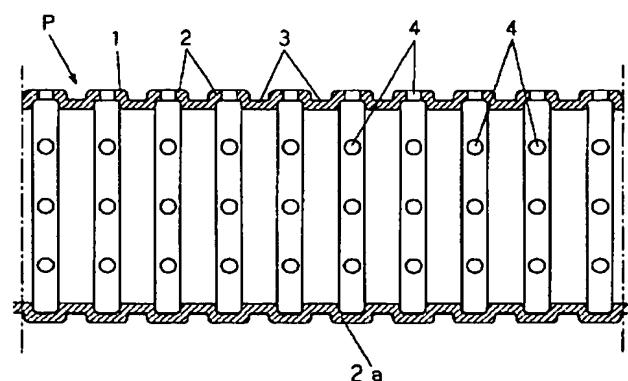
【図5】



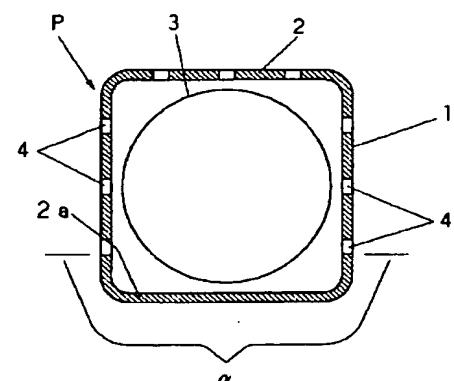
【図4】



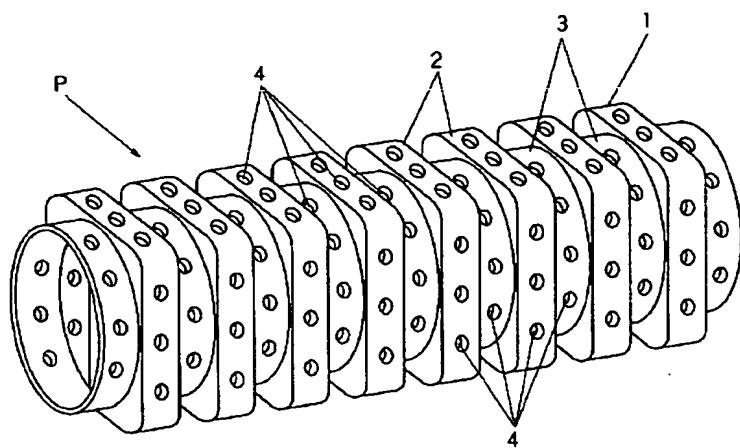
【図7】



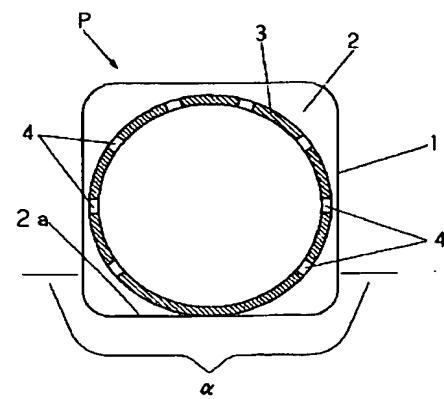
【図8】



【図9】



【図11】



【図10】

